

WHAT IS CLAIMED IS:

1. A cathode ray tube comprising: a panel having a fluorescent formed on an inner surface thereof; a funnel connected to the panel; an electron gun housed in the funnel, emitting electron beams; a deflection yoke for deflecting the electron beams in horizontal and vertical directions; a shadow mask for selecting colors of the electron beams; and a mask frame for supporting the shadow mask, wherein an outer surface of the panel is substantially flat and an inner surface has a designated curvature, and a radius of curvature from a center of the shadow mask in a major-axis, minor-axis and diagonal-axis direction is substantially same.

2. The cathode ray tube according to claim 1, wherein radii of curvature of the shadow mask are substantially same within the length $H/12$ from the center of the shadow mask, H being a minor-axis direction length of the shadow mask.

3. The cathode ray tube according to claim 1, wherein radii of curvature of the shadow mask are substantially same as a distance from the center of the shadow mask is increased in the major-axis, minor-axis and diagonal-axis directions.

4. The cathode ray tube according to claim 1, wherein if the shadow mask satisfies a curvature radius expansion expressed by $Z(x, y) = ax^2 + bx^4 + cy^2 +$

$dy^4+ex^2y^2+fx^4y^2+gx^2y^4+hx^4y^4$, b/a satisfies a condition of $2.2 \times 10^{-6} < b/a < 4.4 \times 10^{-6}$, x and y being a distance (mm) from the center of the shadow mask to a point respectively, and Z being a height difference (mm) between the center of the shadow mask and a point on the shadow mask.

5. The cathode ray tube according to claim 1, wherein if the shadow mask satisfies a curvature radius expansion expressed by $Z(x, y) = ax^2+bx^4+cy^2+dy^4+ex^2y^2+fx^4y^2+gx^2y^4+hx^4y^4$, d/c satisfies a condition of $2.2 \times 10^{-6} < d/c < 4.4 \times 10^{-6}$, x and y being a distance (mm) from the center of the shadow mask to a point respectively, and Z being a height difference (mm) between the center of the shadow mask and a point on the shadow mask.

6. The cathode ray tube according to claim 1, wherein if the shadow mask satisfies a curvature radius expansion expressed by $Z(x, y) = ax^2+bx^4+cy^2+dy^4+ex^2y^2+fx^4y^2+gx^2y^4+hx^4y^4$, b/a satisfies a condition of $2.2 \times 10^{-6} < b/a < 4.4 \times 10^{-6}$ and d/c satisfies a condition of $2.2 \times 10^{-6} < d/c < 4.4 \times 10^{-6}$, x and y being a distance (mm) from the center of the shadow mask to a point respectively, and Z being a height difference (mm) between the center of the shadow mask and a point on the shadow mask.

7. The cathode ray tube according to claim 1, wherein if the radius of curvature from a center of the shadow mask in a major-axis direction is R_{xo} , the radius of curvature in

a minor-axis direction R_{yo} , and the radius of curvature in a diagonal-axis direction R_{do} , the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

8. The cathode ray tube according to claim 1, wherein a thickness of the shadow mask is not greater than 0.1mm.

9. The cathode ray tube according to claim 1, wherein a transmittance at a central portion of the panel is in a range of 45 - 75%.

10. A cathode ray tube comprising: a panel having a fluorescent formed on an inner surface thereof; a funnel connected to the panel; an electron gun housed in the funnel, emitting electron beams; a deflection yoke for deflecting the electron beams in horizontal and vertical directions; a shadow mask for selecting colors of the electron beams; and a mask frame for supporting the shadow mask, wherein an outer surface of the panel is substantially flat and an inner surface has a designated curvature, and if a radius of curvature from a center of the shadow mask in a major-axis direction is R_{xo} , a radius of curvature in a minor-axis direction R_{yo} , and a radius of curvature in a diagonal-axis direction R_{do} , the R_{xo} , R_{yo} and R_{do} are not less than 85% of a maximum value among the R_{xo} , R_{yo} and R_{do} .

11. The cathode ray tube according to claim 10, wherein the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

12. The cathode ray tube according to claim 10, wherein the R_{xo} , R_{yo} and R_{do} are not less than 88% of a maximum value among the R_{xo} , R_{yo} and R_{do} .

13. The cathode ray tube according to claim 12, wherein the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

14. The cathode ray tube according to claim 10, wherein the R_{xo} , R_{yo} and R_{do} within the length $H/12$ from the center of the shadow mask are not less than 85% of the maximum value among the R_{xo} , R_{yo} and R_{do} , H being a minor-axis direction length of the shadow mask.

15. The cathode ray tube according to claim 14, wherein the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

16. The cathode ray tube according to claim 10, wherein if the radius of curvature in the major-axis direction from the shadow mask center is R_{xo} , the radius of curvature in the minor-axis direction R_{yo} , the radius of curvature in the diagonal-axis direction R_{do} , a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask R_{xf} , a radius of curvature at the end of the effective surface in the minor-axis direction R_{yf} , and a radius of curvature at the end of the effective surface in the diagonal-axis

direction Rdf, at least one of Rxf/Rxo, Ryf/Ryo and Rdf/Rdo satisfies conditions of 44.7% $< R_{xf}/R_{xo} < 77.6\%$, $59.0\% < R_{yf}/R_{yo} < 86.1\%$ and $34.6\% < R_{df}/R_{do} < 69.2\%$.

17. The cathode ray tube according to claim 10, wherein if the radius of curvature in the major-axis direction from the shadow mask center is Rxo, the radius of curvature in the minor-axis direction Ryo, the radius of curvature in the diagonal-axis direction Rdo, a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask Rxf, a radius of curvature at the end of the effective surface in the minor-axis direction Ryf, and a radius of curvature at the end of the effective surface in the diagonal-axis direction Rdf, at least one of Rxf/Rxo, Ryf/Ryo and Rdf/Rdo satisfies conditions of 62.6% $< R_{xf}/R_{xo} < 77.6\%$, $74.9\% < R_{yf}/R_{yo} < 86.1\%$ and $52.1\% < R_{df}/R_{do} < 69.2\%$.

18. The cathode ray tube according to claim 10, wherein a thickness of the shadow mask is not greater than 0.1mm.

19. The cathode ray tube according to claim 10, wherein a transmittance at a central portion of the panel is in a range of 45 – 75%.

20. A cathode ray tube comprising: a panel having a fluorescent formed on an inner surface thereof; a funnel connected to the panel; an electron gun housed in the funnel,

emitting electron beams; a deflection yoke for deflecting the electron beams in horizontal and vertical directions; a shadow mask for selecting colors of the electron beams; and a mask frame for supporting the shadow mask, wherein an outer surface of the panel is substantially flat and an inner surface has a designated curvature, and if a minor-axis direction length of the shadow mask is H, a radius of curvature from a center of the shadow mask in a major-axis direction is Rxo, a radius of curvature in a minor-axis direction Ryo, and a radius of curvature in a diagonal-axis direction Rdo, the Rxo, Ryo and Rdo within the length H/12 from the center of the shadow mask satisfy a condition of

$$\frac{\text{Max}(Rxo, Ryo, Rdo) - \text{Min}(Rxo, Ryo, Rdo)}{\text{Max}(Rxo, Ryo, Rdo)} \leq 0.15.$$

21. The cathode ray tube according to claim 20, wherein if the radius of curvature in the major-axis direction from the shadow mask center is Rxo, the radius of curvature in the minor-axis direction Ryo, the radius of curvature in the diagonal-axis direction Rdo, a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask Rxf, a radius of curvature at the end of the effective surface in the minor-axis direction Ryf, and a radius of curvature at the end of the effective surface in the diagonal-axis direction Rdf, at least one of Rxf/Rxo, Ryf/Ryo and Rdf/Rdo satisfies conditions of 44.7% < Rxf/Rxo < 77.6%, 59.0% < Ryf/Ryo < 86.1% and 34.6% < Rdf/Rdo < 69.2%.

22. The cathode ray tube according to claim 20, wherein if the radius of curvature in the major-axis direction from the shadow mask center is Rxo, the radius of curvature in

the minor-axis direction R_{yo} , the radius of curvature in the diagonal-axis direction R_{do} , a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask R_{xf} , a radius of curvature at the end of the effective surface in the minor-axis direction R_{yf} , and a radius of curvature at the end of the effective surface in the diagonal-axis direction R_{df} , at least one of R_{xf}/R_{xo} , R_{yf}/R_{yo} and R_{df}/R_{do} satisfies conditions of $62.6\% < R_{xf}/R_{xo} < 77.6\%$, $74.9\% < R_{yf}/R_{yo} < 86.1\%$ and $52.1\% < R_{df}/R_{do} < 69.2\%$.

23. The cathode ray tube according to claim 20, wherein the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

24. The cathode ray tube according to claim 20, wherein a thickness of the shadow mask is not greater than 0.1mm.

25. The cathode ray tube according to claim 20, wherein a transmittance at a central portion of the panel is in a range of 45 – 75%.